

Remarks

Claims 1, 2, 4-8, 10-12, 15-16, 21, 23-24, and 27-31 are before the Examiner for consideration.

Remarks in the Advisory Action dated September 24, 2008

In the Advisory Action dated September 24, 2008, the Examiner asserts that the combination of Knutsson and Chiu suggests replacing the binder of Knutsson with the binder set forth in Chiu. In addition, the Examiner states that it follows that the curing temperature would be adjusted by one of ordinary skill in the art as required. Further, the Examiner asserts that there is motivation set forth in Chiu to heat the material to 200-300 °C to remove the water from the sugar solution and form a dried article with the sugar in an infusible and insoluble cured, polymeric form. The Examiner asserts that in the combination of Knutsson and Chiu, the additional step of Chiu (*i.e.*, carbonizing the fibers at a high temperature) is not suggested or required. The Examiner maintains that a *prima facie* case of obviousness has been established and has therefore maintained the rejections.

Rejection under 35 U.S.C. §103(a)

The Examiner has rejected claims 1, 2, 4-6, 8, and 10 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,766,541 to Knutsson, *et al.* ("Knutsson"), which incorporates U.S. Patent No. 4,569,471 to Ingemansson, *et al.* ("Ingemansson"), in view of U.S. Patent No. 6,254,810 to Delvaux, *et al.* ("Delvaux") and U.S. Patent No. 6,800,364 to Chiu, *et al.* ("Chiu"). The Examiner asserts that Knutsson teaches a method for making preforms from glass fiber strands where the glass fibers are texturized by separation to form a wool-type product prior to entry into the mold. The Examiner makes note that Knutsson makes reference by incorporation to U.S. Patent No. 4,569,471 to Ingemansson, *et al.* which assertedly teaches that the texturized wool fiber may travel through a hose prior to being fed into the mold. It is asserted that the binder, water, and glass fibers of Knutsson are fed into the mold and the mold is heated to cure the binder. The Examiner also asserts that Knutsson discloses that the binder preferably comprises about 2-10% by weight of the preform. The Examiner admits that Knutsson does not disclose that the binder is sugar in powdered or granulated form.

Chiu is cited for assertedly teaching the employment of a sucrose solution binder that can replace phenolic binders where the preform is heated to a temperature of about 200-300 °C to drive off the liquid from the binder and convert the sugar to an infusible, insoluble form. Delvaux is cited for teaching a strong protective coating for a fabric made of glass fibers where the protective coating contains sugar. The Examiner concludes that it would have been obvious to one of skill in the art to have employed a sugar solution such as a sucrose solution as suggested by Chiu and Delvaux in the method of Knutsson to provide an excellent protective cover for the fabric and to replace the binder of Knutsson with an environmentally friendly binder.

In response to this rejection, Applicant respectfully directs the Examiner's attention to independent claim 1 submits that claim 1 defines a method of forming a preform that is not taught or suggested within Knutsson, Delvaux, and Chiu, either alone or in any combination.

In particular, Applicant respectfully submits that neither Knutsson nor Delvaux teaches or suggests the inclusion of sugar in the preform in an amount from about 2 to about 10% by weight as claimed in claim 1. With respect to Knutsson, Applicant submits that Knutsson is silent with respect to any teaching or suggestion of the use of a sugar binder. In fact, it is submitted that Knutsson does not teach or suggest the use of sugar, as a binder or otherwise. Delvaux specifically teaches an aqueous suspension of wollastonite, colloidal silica, and sugar. (*See, e.g.*, column 3, lines 27-31). Applicant submits that an aqueous solution of wollastonite, colloidal silica, and sugar is very different from a liquid sugar binder. It is therefore submitted that neither Knutsson nor Delvaux teaches or suggests the liquid sugar binder, or the step of feeding a liquid sugar and glass fibers into a preform mold, as claimed in claim 1. Further, Applicant submits that if Delvaux was combined with Knutsson, the combination would not result in the method of forming a preform for a muffler as claimed in claim 1. Indeed, the combination would result in the addition of wollastonite, colloidal silica, and sugar to glass fibers, not the addition of a liquid sugar.

Additionally, Applicant submits that Knutsson specifically teaches the utilization of a powdered binder. (*See, e.g.*, column 1, lines 62-63; column 3, lines 59-61; and column 8, lines 50-51). Applicant submits that a powdered binder and a liquid binder are not necessarily interchangeable. As such, Applicant submits that one of skill in the art reading Knutsson would have no incentive to look elsewhere for a non-powdered binder.

Assuming, *arguendo*, that one of skill in the art were to look to Chiu for a liquid sugar binder, Chiu teaches a binder that is an aqueous solution of a soluble sugar. (*See, e.g.*, column 2, lines 58-62 and column 4, lines 13-17). Chiu specifically teaches a binder that includes about 15 to about 80% sugar dissolved in water. (*See, e.g.*, column 4, lines 19-20). Chiu further teaches that the binder more preferably includes 20-60% sugar and most preferably 45-60% sugar. (*See, e.g.*, column 4, lines 20-22).

In the Advisory Action, the Examiner states that the combination of Knutsson and Chiu suggests replacing the binder of Knutsson with the binder of Chiu. (*See* page 3, lines 3-4 of the Advisory Action dated September 24, 2008). Applicant respectfully submits that if the binder of Knutsson were replaced with the binder of Chiu, as suggested by the Examiner, the result would be the addition of a liquid binder with a sugar content of 15-80%. Applicant submits that the sugar content in the binder of Chiu is vastly different, and much greater, than the method of claim 1 in which the preform includes sugar in an amount from about 2 to about 10% by weight of the preform. Applicant submits that there is simply no teaching or suggestion within Chiu of the inclusion of sugar in an amount from about 2 to about 10% by weight of the preform as required by claim 1. As discussed above, Knutsson and Chiu do not teach or even suggest a liquid sugar binder. Thus, it is respectfully submitted that even if Delvaux and Chiu were combined with Knutsson, the combination would not result in the method of claim 1 at least because Chiu clearly teaches a sugar content in the liquid binder in an amount of at least 15%. Accordingly, it is submitted that claim 1 is non-obvious and patentable.

In addition, the Examiner asserts in the outstanding Office Action that Knutsson teaches that the binder is added in an amount from about 2 to about 10% by weight of the preform. (*See, e.g.*, paragraph bridging pages 2 and 3 of the Office Action dated July 21, 2008). It is respectfully submitted that no matter what how much binder is added to the muffler shell to make the preform, the sugar content in the binder is still at least 15%. Thus, the sugar content in the preform will be greater than 15%. It is respectfully submitted that the amount of sugar in the binder of Chiu is well outside the range for the sugar included in the preform formed by the method of claim 1.

Additionally, Applicant submits that Chiu teaches away from a method of making a preform where the preform includes sugar in an amount from about 2 to about 10% by weight of the preform as claimed in claim 1. As discussed above, Chiu specifically teaches a liquid

binder that contains from about 15 to about 80% by weight sugar. (*See, e.g.*, column 4, lines 19-20). There is simply no teaching or suggestion within Chiu of a preform that contains from about 2 to about 10% sugar. Applicant respectfully submits that one ordinarily skilled in the art reading Chiu would be led away from forming a preform that includes sugar in an amount from about 2 to about 10% by weight of the preform as required by claim 1. As such, it is respectfully submitted that claim 1 is non-obvious and patentable for this additional reason.

Further, Applicant submits that there is no motivation for one of skill in the art to arrive at the method claimed in claim 1 based on the disclosures of Knutsson, Delvaux, and/or Chiu. To establish a *prima facie* case of obviousness, there must be some motivation, either within the reference or in the knowledge of those of skill in the art, to modify the reference or combine the references' teachings, there must be a reasonable expectation of success, and the prior art references must meet all of the claim limitations. (*See, e.g., Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 3, August 2007, §2142). It is respectfully submitted that one of ordinary skill in the art would have no motivation to arrive at a method of forming a preform for a muffler that includes (1) texturizing glass strands by separating the glass strands into individual glass fibers prior to feeding the glass fibers into a preform mold, (2) feeding liquid sugar and the glass fibers into the preform mold, (3) heating the preform mold to a temperature sufficient to at least partially caramelize the sugar, where the caramelized sugar adheres to the glass fibers to form sugar-coated glass fibers, and (4) cooling the preform mold to bind the sugar-coated glass fibers together and form the preform, where the preform includes sugar in an amount from about 2 to about 10% by weight based on the preform based on the teachings of Knutsson, Delvaux, and Chiu. The combination of Knutsson, Delvaux, and Chiu simply does not teach or suggest the claimed method, particularly the inclusion of sugar in the preform in an amount from about 2 to about 10% by weight of the preform. Without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.

Also, as discussed above, none of Knutsson, Delvaux, or Chiu teaches or suggests a method for making a preform that includes sugar in an amount from about 2 to about 10% by weight of the preform. Therefore, Applicant respectfully submits that Knutsson, Delvaux, and Chiu, alone or in combination, fail to teach all of the claim limitations set forth in claim

1. Accordingly, it is submitted that a *prima facie* case of obviousness has not been established for this additional reason

In view of the above, Applicant respectfully submits that claim 1 is patentably distinguishable over Knutsson, Delvaux, and Chiu, either alone or in combination. Because claims 2, 4-6, 8, and 10 are dependent upon independent claim 1 and contain the same elements as claim 1, claims 2, 4-6, 8, and 10 are also submitted to be non-obvious and patentable.

Accordingly, Applicant respectfully submits that claims 1, 2, 4-6, 8, and 10 are not obvious over Knutsson in view of Delvaux and Chiu and respectfully requests that the Examiner reconsider and withdraw this rejection.

Rejection under 35 U.S.C. §103(a)

Claim 7 has been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,766,541 to Knutsson, *et al.* ("Knutsson"), which incorporates U.S. Patent No. 4,569,471 to Ingemansson, *et al.* ("Ingemansson"), in view of U.S. Patent No. 6,254,810 to Delvaux, *et al.* ("Delvaux") and U.S. Patent No. 6,800,364 to Chiu, *et al.* ("Chiu") as applied to claims 1, 2, 4-6, 8, and 10 above, and further in view of U.S. Patent No. 5,317,037 to Golden, *et al.* ("Golden"). The Examiner asserts that the combination of cited references does not expressly teach the melting point of the powdered sugar. In this regard, Golden is cited for teaching that sugars can be used as binders and that the sugars have a melting point in the range of 120 °C (248 °F) to 175 °C (347 °F). The Examiner asserts that it would have been obvious to one of skill in the art to employ a sugar such as sucrose, fructose, or dextrose as the sugar binder in the combination set forth above for the purpose of employing readily available and well-known sugars as effective binders.

In response to this rejection, Applicant respectfully directs the Examiner's attention to claim 1 and to the arguments set forth above with respect to the rejection of claims 1, 2, 4-6, 8, and 10 under 35 U.S.C. §103(a) to Knutsson in view of Delvaux and Chiu and submits that claim 1 defines a method of forming a preform for a muffler that is not taught or suggested within Knutsson, Delvaux, and Chiu. In addition, Applicant submits that the teachings of Golden do not add to the Examiner's rejection so as to make claim 1 unpatentable. Even with the addition of the teachings of Golden, Knutsson, Delvaux, and Chiu still do not teach or suggest a method of forming a preform for a muffler that includes (1) texturizing glass

strands by separating the glass strands into individual glass fibers prior to feeding the glass fibers into a preform mold, (2) feeding liquid sugar and the glass fibers into the preform mold, (3) heating the preform mold to a temperature sufficient to at least partially caramelize the sugar, where the caramelized sugar adheres to the glass fibers to form sugar-coated glass fibers, and (4) cooling the preform mold to bind the sugar-coated glass fibers together and form the preform, where the preform includes sugar in an amount from about 2 to about 10% by weight based on the preform as claimed in claim 1. As such, it is submitted that the combination of Knutsson, Delvaux, Chiu, and Golden does not teach or suggest Applicant's invention as recited in claim 1. Because claim 7 is dependent upon claim 1, which, as discussed in detail above, is not taught or suggested by Knutsson, Delvaux, Chiu, and Golden, Applicant submits that claim 7 is also not taught or suggested by Knutsson, Delvaux, Chiu, and/or Golden.

In view of the above, Applicant respectfully submits that claim 7 is non-obvious and patentable over the combination of Knutsson, Delvaux, Chiu, and Golden and respectfully requests that the Examiner reconsider and withdraw this rejection.

Rejection under 35 U.S.C. §103(a)

Claim 31 has been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,766,541 to Knutsson, *et al.* ("Knutsson"), which incorporates U.S. Patent No. 4,569,471 to Ingemansson, *et al.* ("Ingemansson"), in view of U.S. Patent No. 6,254,810 to Delvaux, *et al.* ("Delvaux") and U.S. Patent No. 6,800,364 to Chiu, *et al.* ("Chiu") as applied to claims 1, 2, 4-6, 8, and 10 above, and further in view of U.S. Patent Publication No. 2003/0087095 to Lewis, *et al.* ("Lewis"). The Examiner asserts that the combination of references does not expressly teach the employment of sugar syrups. In this regard, Lewis is cited for assertedly teaching a method of using high fructose corn syrup as a binder. The Examiner concludes that it would have been obvious to one of skill in the art to modify the method of Knutsson to employ corn syrup or high fructose corn syrup as the binder since Lewis suggests that they are an alternative form of sugar suitable for employment as a binder.

In response to this rejection, Applicant respectfully directs the Examiner's attention to claim 1 and to the arguments set forth above with respect to the rejection of claims 1, 2, 4-6, 8, and 10 under 35 U.S.C. §103(a) to Knutsson in view of Delvaux and Chiu and submits that claim 1 defines a method of forming a preform for a muffler that is not taught or suggested

within Knutsson, Delvaux, and Chiu. In addition, Applicant submits that the teachings of Lewis do not add to the Examiner's rejection so as to make claim 1 unpatentable. Even with the addition of the teachings of Lewis, Knutsson, Delvaux, and Chiu still do not teach or suggest a method of forming a preform for a muffler that includes (1) texturizing glass strands by separating the glass strands into individual glass fibers prior to feeding the glass fibers into a preform mold, (2) feeding liquid sugar and the glass fibers into the preform mold, (3) heating the preform mold to a temperature sufficient to at least partially caramelize the sugar, where the caramelized sugar adheres to the glass fibers to form sugar-coated glass fibers, and (4) cooling the preform mold to bind the sugar-coated glass fibers together and form the preform, where the preform includes sugar in an amount from about 2 to about 10% by weight of the preform as claimed in claim 1. As such, it is submitted that the combination of Knutsson, Delvaux, Chiu, and Lewis does not teach or suggest Applicant's invention as recited in claim 1. Because claim 31 is dependent upon claim 1, which, as discussed in detail above, is not taught or suggested by Knutsson, Delvaux, Chiu, and Lewis, Applicant submits that claim 31 is also not taught or suggested by Knutsson, Delvaux, Chiu, and/or Lewis.

In view of the above, Applicant respectfully submits that claim 31 is non-obvious and patentable over the combination of Knutsson, Delvaux, Chiu, and Lewis and respectfully requests that the Examiner reconsider and withdraw this rejection.

Indication of Allowable Subject Matter

Applicant appreciates the indication of allowance of claims 11, 12, 15, 16, 21, 23, 24, and 27-31 and requests that these claims be passed to allowance with the remaining claims in the application.

Conclusion

In light of the above, Applicant believes that this application is now in condition for allowance and therefore requests favorable consideration.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

If necessary, the Commissioner is hereby authorized to charge payment or credit any overpayment to Deposit Account No. 50-0568 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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